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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/765,835

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Tatsuo Suzuki

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EXAMINER

MUHAMMED, ABDUKADER S

ART UNIT	PAPER NUMBER
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2627

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06/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/765,835	Applicant(s) SUZUKI ET AL.	
	Examiner Abdukader Muhammed	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawing

2. Figure 10 should be designated by a legend such as **--Prior Art--** because only that which is old is illustrated (see page 1 the related art section, lines 19-21 of the instant application). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 6 and 18 are objected to because of the following informalities:

In claim 6, line 5-6 "the block of the storage location **of** detected by the detection processing" should be "the block of the storage location detected by the detection processing".

In claim 18, line 6 "storing **tow** or more" should be "storing **two** or more".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5, 7-16, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the teachings of the related art discussion in the instant invention further in view of Liew et al. (US Publication 2002/0191319 A1).

Regarding claim 1, the related art section of the instant invention discloses a disk controller, which performs a control associated with record of data on a disk and reproduction of data recorded on the disk, comprising: a first memory for storing a first software to perform a first processing (flash memory 9 for storing a firmware; see figure 10 and page 1, lines 13-18 of the instant invention); a second memory for storing a second software to perform a second processing (mask ROM 10 for storing micro-code; see figure 10 and page 1, lines 13-18 of the instant invention); and processing means for reading the first and second software from the first memory and the second memory to independently perform the first processing and the second processing each other (CPU 7 which controls the firmware and the micro-code independently; see figure 10 and page 2, lines 10-13 of the instant invention), the first processing includes a seek control processing of performing a seek control of the optical disk, and a transmission processing of transmitting information indicating the storage location of data recorded on the optical disk, which includes defect management information indicating an alternative storage location of a defective block, to the second software, (processes implemented in the firmware include defect managing process and a reproduction process that is performed across a spare area and control of an optical pick-up or seek operation; see the description of the related art section on page 6, lines 9-18).

The description of the related art section differs from the claimed invention in that it does not specifically show that the second processing includes a detection processing of detecting the storage location of data recorded on the optical disk based on the storage location information, and a notification processing of notifying a request for seeking the storage location, in which data detected by the detection process is recorded on the disk, to the first software. Liew et al. on the other hand teach that the memory 143 (other than the firmware 145) includes programming modules: defective sector identifying module; see page 3, paragraph [0030], lines 8-10, conversion module notifies by updating the pointer to point to the next defective sector address; see figure 11, step 812) and during seek operation the controller 142 receives information from memory 143 (see page 3, paragraph [0032], lines 8-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the memory in such a way since Liew et al. teach that during each disk drive power up, the information stored in the defect table of is loaded into memory and the controller uses this information to prevent reading from or writing to the defective area (see page 5, paragraph [0044], lines 7-11).

Regarding claim 2, the combination of Liew et al. (US Publication 2002/0191319 A1) and the related art discussion in the instant invention teach the limitations of claim 1 for the reasons discussed above. The combination differs from the claimed invention in that it does not specifically show a plurality of the first software and a plurality of the first memory. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a plurality of the first software and a plurality of the first memory in the system of the combination of Liew et al. (US Publication 2002/0191319 A1) and the teachings known in the

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art. The rationale is that having more memory speeds up the processing of codes and gives more space to have more program/software space.

Regarding claims 3 and 13 as applied to claims 1 and 12 and also the related art section of the instant invention shows that the speed of which the processing means reads the first software from the first memory is lower than a speed of which the processing means reads the second software from the second memory (the microcode can operate faster than the firmware; see page 2, lines 10-17 of the instant invention).

Regarding claims 4 and 14, as applied to claims 1 and 12 and also the related art section of the instant invention shows that the first memory is flash memory (the firmware is in flash memory and the second memory is ROM; see figure 10 of the instant invention).

Regarding claims 5 and 15, as applied to claims 1 and 12 and also the related art section of the instant invention shows that the first program is firmware and the second program is a microcode (see figure 10 of the instant invention).

Regarding claim 7, as applied to claim 1 above the description of the related art section shows that the first processing has information extraction processing of extracting only information required for reproduction of the data stored on the optical disk and organizing the information into a defect management information to be transmitted to the second software (implementation of the firmware includes defect managing process and a reproduction process; see page 6, lines 9-17).

Regarding claim 8, as applied to claim 1 above and Liew et al. also teach that the defect management information is organized in tabular form (there is a defect table 123; see figure 2).

Regarding claim 9, as applied to claim 7 above and Liew et al. also teach that the data storage locations of the defect management information are arranged in an ascending order (see page 5, table 3).

Regarding claim 10, as applied to claim 7 above and Liew et al. also teach that the defect management information includes an identification code which indicates an end of a table (at the end of padding the defect list the program updates the pointer to the next defective sector; see step 812 of figure 11).

Regarding claims 11 and 16, as applied to claims 1 and 12 and also the related art section of the instant invention shows that the defect management information is in conformity with Mt. Rainier standards of optical disks (see figure 10 of the instant invention).

Regarding claim 12, the related art section of the instant invention discloses a disk controller, which performs a control associated with record of data on a disk and reproduction of data recorded on the disk, comprising: a first memory for storing a first software to perform a first processing (flash memory 9 for storing a firmware; see figure 10 and page 1, lines 13-18 of the instant invention); a second memory for storing a second software to perform a second processing (mask ROM 10 for storing micro-code; see figure 10 and page 1, lines 13-18 of the instant invention); and processing means for reading the first and second software from the first memory and the second memory to independently perform the first processing and the second processing each other (CPU 7 which controls the firmware and the micro-code independently; see figure 10 and page 2, lines 10-13 of the instant invention), the first processing includes a seek controlling process of performing a seek control of the optical disk (processes implemented in the firmware include defect managing process and a reproduction process that is performed

across a spare area and control of an optical pick-up or seek operation; see the description of the related art section on page 6, lines 9-18).

The description of the related art section differs from the claimed invention in that it does not specifically show that the second processing includes a detection processing of detecting that data stored in a buffer memory temporarily storing data which the processing means reads from the optical disk is data storage location of last block of a first data area, notification processing of notifying a request for a seek for first block of a second data area following last block of the first data area to the first software, and connection processing of connecting the last block of the first data area and the first block of the second data area which are logically continuous. Liew et al. on the other hand teach that the memory 143 (other than the firmware 145) includes data store area 152 for temporarily storing data (see figure 2) and during seek operation the controller 142 receives information from memory 143 (see page 3, paragraph [0032], lines 8-15), the memory 143 also includes conversion module 158 merges two defective adjacent sectors or blocks. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the memory in such a way since Liew et al. teach that during each disk drive power up, the information stored in the defect table is loaded into memory and the controller uses this information to prevent reading from or writing to the defective area (see page 5, paragraph [0044], lines 7-11).

Regarding claims 20-21, apparatus claims 20-21 are drawn to the apparatus which comprises/uses the corresponding optical disk controller on a memory medium claimed in claims 1 and/or 11. Therefore the apparatus claims 20-21 correspond to optical disk controller claims 1 and /or 11 and are rejected for the same reasons of obviousness as indicated above.

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6. Claims 6 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the teachings of the related art discussion in the instant invention in view of Liew et al. (US Publication 2002/0191319 A1) as applied to claim 1 above, further in view of IBM Technical Disclosure TBD NN9408185, p. 185-188, (August 1, 1994).

Regarding claim 6, the combination of Liew et al. (US Publication 2002/0191319 A1) and the discussion of the related art section of the instant invention teach the limitations of claim 1 for the reasons discussed above. The combination differs from the claimed invention in that it does not specifically show the second processing includes a defect detection processing of detecting that a block of the storage location detected by the detection processing is a defective block, and judgment processing of judging whether an alternative storage location of data to be read is two or more consecutive blocks based on the defect management information when the block of the storage location of detected by the detection processing is the defective block, wherein two or more consecutive blocks of data read as a result of a seek for a first block of the alternative storage location are stored in a buffer memory to accommodate a second and subsequent blocks of the alternative storage location when the judgment processing judges that the alternative storage location of the data to be read is two or more consecutive blocks.

IBM Technical Disclosure TBD NN9408185, p. 185-188, (August 1, 1994) on the other hand discloses that if the initiator is executing a multi-sector read or write, the drive is required to seek between the nominal contiguous sectors and any replacement sectors. These added seeks cause a considerable performance impact and the proposed method is summarized as a cache memory buffer mechanism dedicated for the storage of some number of replacement sectors (see the last three lines on the first page through the first seven lines on the second page). It would

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have been obvious to one of ordinary skill in the art at the time the invention was made to use a buffer memory in such a way since IBM Technical Disclosure TBD NN9408185, p. 185-188, (August 1, 1994) discloses that cache mechanism would allow the drive to avoid the costly seeks associated with reading replacement sectors when a cache 'hit' occurs (see lines 7-9 on the first page).

Regarding claims 17-19, method claims 17-19 are drawn to the method of using the corresponding optical disk controller on a memory medium claimed in claims 1-16. Therefore the method claims 17-19 correspond to optical disk controller claims 1-16 and are rejected for the same reasons of obviousness as indicated above.

Conclusion

7. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Watanabe et al. (US 2002/0181356 A1) teach an optical disc controller that includes a first memory 300 and a second memory 400 (see figure 10).

Yamamoto et al. (US 20030142608 A1) teach Information recording/reproduction apparatus and method with defect management having a firmware 304 and a memory section 306 (see figure 3).

Cornaby et al. (US 6286057 B1) teach a data storage device which has a firmware 74B controlling seek operation and defect management (see figure 6).

Seng et al. (US 2003/0002197 A1) teach a disc drive which has a controller 142, firmware 145 and memory 143 (see figure 2).

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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08 June 2007

WAYNE YOUNG
SUPERVISORY/PATENT EXAMINER

